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PUTTING BACTERIA TO WORK ON THE GARDEN SURPLUS

A radio talk by Dr. F. C. Blanck, in charge, Food Research Division, Bureau of Chemistry and Soils, delivered at 1:10 p.m. E.S.T., Monday, August 18, through 38 associated stations of the National Broadcasting Company in the National Farm and Home Hour.

A month ago when Mr. Salisbury asked me if I would talk with you growers of garden products about putting bacteria to work on your surplus crops, it looked as if we would have the normal seasonal surplus of such vegetables as cucumbers, green tomatoes, beets, and so on, in most parts of the country. Since then the drought in the Ohio and Mississippi valleys and elsewhere has made my talk somewhat inappropriate for a good many of you. You will have no surplus -- or any other -- garden crops this year.

I hope that those of you who are in that fix because of the drought will not take it unkindly if I go ahead anyway with this talk for the benefit of more fortunate truck growers or home gardeners who this year will have some surplus crops.

Such surpluses can be readily saved with the help of salt and some bacteria. All you have to provide is the salt. The bacteria, which cause the vegetables to ferment into pickles, already are present on the garden products. So, add salt or brine to surplus vegetables and allow them to ferment to pickles. Cucumbers are generally preserved in this way, but other products can be made into equally as good pickles. Cabbage, string beans, green tomatoes, beets and other vegetables, properly fermented, make excellent pickles that will keep indefinitely.

The same method is followed in pickling; all these products. Let's look at the method of treating cucumbers.

You have to have a container, of course. For small-quantity production in the home, earthenware jars are best. For larger quantities clean barrels will serve. Any wooden container, by the way, must be carefully cleaned before using.

Fill the containers with sound cucumbers, or other vegetables. Add one pound of salt for each 10 pounds of vegetables. When the stack gets close to the top, cease filling and put on the cover -- either a wooden one, or a heavy dish. Weight down the cover so it will keep the cucumbers below the surface of the brine which will soon appear.

The salt extracts the juice from the cucumbers. That furnishes the brine to support the fermentation. Along with juice from the cucumbers, the salt draws into the solution sugar normally present in the vegetable. This juice ferments to acetic acid and other acids.

That is the way the bacteria work for you. To help them along, maintain a temperature of about 85 degrees Fahrenheit during the course of the fermentation. Remember also that as the juice is extracted from the vege-

tables the concentration of salt in the solution greatly decreases. The fermentation proceeds best at a salt concentration of about 5 per cent. But such a solution is too weak to preserve the pickles after the fermentation is completed. So you have to add enough salt to bring the brine up to 10 per cent strength. Dissolve the additional salt gradually by placing it on the cover. It's fatal to let a large amount of the salt fall to the bottom. It forms a very strong brine in the lower layers and leaves the upper layers too weak to stop undesirable fermentations.

Depending on the temperature maintained, your fermentation will finish in anywhere from a week to a month. The higher the temperature, the faster the bacteria grow, therefore, the more rapidly the sugar is broken down and the more rapidly is acid produced -- in other words; the warmer the temperature, the quicker your products are made. However, too high a temperature may prevent fermentation. You can tell when the process is done by observing when bubbling ceases. The bubbling is caused by liberation of gases during the fermentation. Naturally, when the fermentation ceases there is no more gas released.

Let me caution you that a scum probably will develop on the surface during fermentation. This scum is a thin film of yeasts and bacteria. Remove it carefully and often in order to prevent decomposition and spoilage of the pickles.

When the fermentation ceases, place the pickles in jars, cover with their own or fresh brine, and seal tightly. Fresh brine is preferable. It should contain about 10 per cent salt. You can remember the rule that 1 pound salt to 9 pints of water makes a 10 per cent brine solution -- or you can get and use a salinometer, an instrument indicating the concentration of salt in a brine.

Straight fermentation of pickles such as I have just described is not the only method of preserving vegetables. Many variations on the pickling method are possible. You can preserve string beans, green tomatoes, and beets by curing in a salt brine with the addition of vinegar and without fermentation. The trick is to add enough vinegar to take the place of the vinegar usually made from sugar extracted from the vegetables during fermentation. But this process requires care. If the brine is too strong at the start, or if you use too much vinegar at the start, your product will be tough, because the water will be extracted from the vegetables too quickly.

These same vegetable products can be preserved also with the addition of spices, dill herbs, sirups to make sweet pickles, and so on. All you need for making excellent fermented pickles from many vegetables and fruits are a few instruments for determining the acidity and the amount of salt in the brine, and the containers. Farmers' Bulletin 1438-F, "Making Fermented Pickles" contains full directions for the preparation of various types of pickles. Send your request for it to the Department if you are interested in putting the bacteria to work on your garden surplus this year -- or next year.